

# The butterflies of Jordan

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**Abstract:** A total of 97 species and subspecies of butterflies have been recorded from the different ecological zones in Jordan. Available biological or ecological notes are given for each species. An updated list for the butterflies of Jordan is given.

**Key words:** Butterflies, Jordan, Papilionidae, Pieridae, Lycaenidae, Nymphalidae, Hesperiidae.

## Introduction

The oldest literature dealing with the butterflies of Jordan goes back to the beginning of the 20<sup>th</sup> century. While stationed in Jordan, Mr. J. PHILBY collected butterflies from the Jordan Valley and the mountains of Jordan, GRAVES (1925) and HEMMING (1932) studied this collection and gave the first comprehensive study on the Jordanian butterflies. A series of papers were published by LARSEN (1975, 1976, 1977, 1984 a, b) about the butterflies of Jordan and nearby areas. AL MUSA (1979) listed 40 species of butterflies. Other reports include HARDY (1995), FABIANO (1998) and TEN HAGEN (1996, 1998). LARSEN & NAKAMURA (1983) published the most outstanding study of the butterflies of Jordan. They gave detailed information on previous collections and examined materials either housed in Jordan or abroad. The attempt to study the butterflies of Jordan by Jordanian naturalist begin with the publication of the butterflies along with other insects in Azraq Desert Oasis by AMR et al. (1997), where they reported on 11 species of butterflies. Recently KATBEH-BADER et al. (1998 [2003]) reported on the butterflies of Jordan based on a collection at the University of Jordan Insects Museum (Amman) and the Jordan Natural History Museum (Irbid) that totalled 3350 specimens. They added two additional records *Colotis danae* and *Anthrocharis gruneri*. There after, BENYAMINI (2001, 2002a, b) published a comprehensive study on the

butterflies of Dana Nature Reserve including a list of the butterflies of Jordan. He added 14 new records to the list of LARSEN & NAKAMURA (1983).

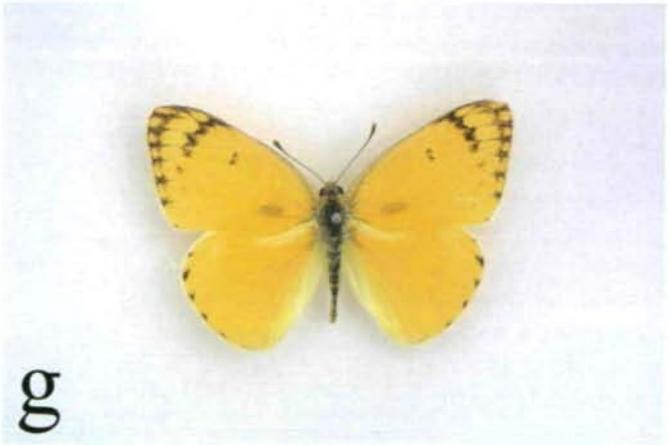
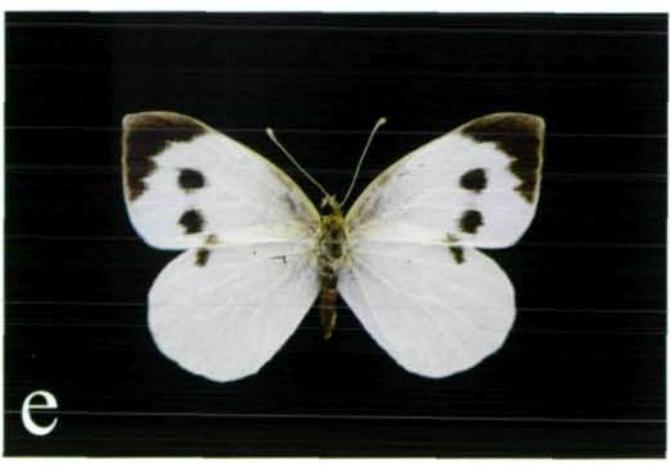
The present study represents an updated revision for the butterflies of Jordan based on LARSEN & NAKAMURA (1983), KATBEH-BADER et al. (1998 [2003]), and BENYAMINI (2001, 2002a, b). A brief discussion on the butterflies of Jordan is also given.

## Systematic Account

A total of 97 species of butterflies representing five families (Papilionidae, Pieridae, Lycaenidae, Nymphalidae and Hesperiidae) are reported. Families Pieridae, Lycaenidae and Nymphalidae have a close number of species (24, 25 and 27 respectively), while family Papilionidae is represented by five species. We followed the systematic treatment adopted by LARSEN & NAKAMURA (1983).

### Family Papilionidae

This family is represented by three subfamilies (Papilioninae, Zyrenthiinae and Parnassinae) and five species. Swallowtails are of a large and intermediate size with a great flexibility of wing patterns and coloration (white, yellow, green and brown). The anal edge of the hind wing is usually concave. Legs are well developed and act while walking (KORSHUNOV & GORBUNOV 1995).



**Papilioninae*****Papilio machaon syriacus***

VERITY 1905 (Fig. 1a)

The Swallowtail is a Holarctic species with a wide range of distribution. The subspecies *P. m. syriacus* is confined to the Levant. In Jordan, it occurs in the northern and southern Mediterranean zones and in the Jordan Valley. LARSEN & NAKAMURA (1983) reported specimens as far south as Ras el Naqb. Collecting months suggests two broods, one in early March and extends to May, followed by another in October (KATBEH-BADER et al. 1998 [2003]). Larvae feed on several species of the families Umbelliferae and Rutaceae. This beautiful butterfly is not common and its collections by the locals as an ornamental item may affect its population.

***Papilio alexenor maccabaeus***

STAUDINGER 1891

The Tiger Swallowtail is a rare species which is found in the northern Mediterranean zone of Jordan (KATBEH-BADER et al. 1998 [2003]). Previously collected from Wadi Kufringi and Wadi Zarqa. NAKAMURA & AE (1977) gave a comprehensive account on its biology, in which they indicated that peak activity occurs during April.

***Papilio saharae* OBERTHÜR 1879**

This species was considered as a subspecies of the European *P. machaon*. LARSEN (1990) discussed its specific status and concluded that it should be treated as a separate species. It is distributed from Morocco to Egypt, Sinai, the Naqab of Palestine to southern Jordan and southwards to Hejaz (LARSEN 1990).

**Zyrenthiinae*****Allancastria deyrollei eisneri***

BERNARDI 1971 (Fig. 1b)

The Lebanese Festoon occurs in Turkey and the Levant. It is confined to the Mediterranean regions of Jordan, and less frequent in the Jordan Valley (KATBEH-BADER et al. 1998 [2003]). Previously collected as far as Petra in southern Jordan by Lockhart (LARSEN & NAKAMURA 1983). Peak activity occurs during April and declined thereafter. This species is associated with the Moorish Birthwort, *Aristolochia maurorum*, a mountainous plant of the family Aristolochiaceae (KATBEH-BADER et al. 1998 [2003]).

**Parnassiinae*****Archon apollinus bellargus***

STAUDINGER 1891 (Fig. 1c)

The False Apollo is a Pontomediterranean butterfly, limited to Bulgaria, Turkey, the Levant and Iraq. It is found in the Mediterranean zones and the Jordan Valley. Collecting months suggests one brood annually that occurs in March and April (KATBEH-BADER et al. 1998 [2003]). Similar to *A. d. eisneri*, larvae prefer the Moorish Birthwort as a food source.

**Family Pieridae**

This family is represented by two subfamilies (Pierinae and Coliadinae) including 24 species. Family Pieridae includes butterflies of intermediate size. The wing ground colour is usually white, yellow or orange, with black or greenish markings. The head is rounded and all the legs are equally developed and used for walking (KORSHUNOV & GORBUNOV 1995). Larvae are mostly green in colour, mostly with markings and stripes. Larvae feed predominantly on Brassicaceae and Fabaceae. Several species of this family are considered agricultural pests.

**Fig. 1: a:** *Papilio machaon syriacus*: A Holarctic swallowtail with a wide range of distribution in the northern and southern Mediterranean zones. **b:** *Allancastria deyrollei eisneri*: The Lebanese Festoon is confined to the Mediterranean regions of Jordan. **c:** *Archon apollinus bellargus*: The False Apollo is a Pontomediterranean butterfly, found in the Mediterranean zones and the Jordan Valley. **d:** *Aporia crataegi augustior*: The Black-veined White is widely distributed in the Palaearctic region. It is common in the mountainous areas and along the Jordan Valley. **e:** *Artogeia rapae leucosoma*: The Small White is a migratory butterfly found throughout the Holarctic region. The subspecies *leucosoma* is mostly associated with the Mediterranean ecozone and the Jordan Valley. **f:** *Pontia daplidice*: The Bath White is one of the most common species inhabiting almost all parts of Jordan except the southern desert. **g:** *Madais fausta*: The Salmon Caper Butterfly is a rather migratory species with a distribution confined to the Jordan Valley and the upper Mediterranean zone. **h:** *Colotis danae eupompe*: The Scarlet Tip is an Afrotropical butterfly being one of the most widespread butterflies, however, a single specimen was collected from Mahis, Jordan.

**Pierinae*****Aporia crataegi augustior***

GRAVES 1925 (Fig. 1d)

The Black-veined White is widely distributed in the Palaearctic region. In Jordan, it is common in the mountainous areas and along the Jordan Valley. Peak activity occurs in April. LARSEN (1977) reported on the seasonal fluctuation of this butterfly, and indicated that it becomes very scarce and later reappear in relatively high numbers. He reported that this phenomenon is known among populations occurring at the limit of its distribution. Larvae feed on *Crataegus*, *Amygdalus* and other Rosaceae where they may become pests (KATBEH-BADER et al. 1998 [2003]).

***Pieris brassicae catoleuca RÖBER 1896***

The Large White is found from North Africa via most of Europe and the Middle East to the Himalayas. It is a migrant species common in the Mediterranean zones of Jordan from which it penetrates the Jordan Valley. Its presence throughout of the year suggests that it have several broods (KATBEH-BADER et al. 1998 [2003]). It feeds on several species of family Cruciferae and *Capparis spinosa* (Fam. Capparidaceae).

***Artogeia rapae leucosoma***

SCHAWERDA 1905 (Fig. 1e)

The Small White is a migratory butterfly found throughout the Holarctic region. The subspecies *A. r. leucosoma* is mostly associated with the Mediterranean ecozone and the Jordan Valley (KATBEH-BADER et al. 1998 [2003]). It was collected all-year round, and populations in the Jordan valley have several broods. Butterflies were observed in remote areas as Qasr Burqu' in the eastern desert as well as in the busy streets downtown in Amman. AMR et al. (1997) mentioned that it was of the commonest species found in Al Azraq Reserve.

***Artogeia napi dubiosa RÖBER 1907***

BENYAMINI (2001) listed this species as a secondary species in northern Jordan. This is a widely distributed species from Japan to Europe. Known from Lebanon (LARSEN 1974) and northern Palestine (BENYAMINI 1997).

***Pontia daplidice daplidice LINNAEUS 1758***

(Fig. 1f)

The Bath White is one of the most common species inhabiting almost all parts of Jordan except the southern desert. It mainly feeds on a species of the genus *Reseda* (LARSEN & NAKAMURA 1983). AMR et al. (1997) found it associated with *Tamarix* and *Alhaja marorum* in Al Azraq Reserve.

***Pontia glauconome glauconome KLUG 1829***

The Desert White is an eremic species found in North Africa, Arabian and Middle Eastern deserts. It occurs in the southern Jordan Valley, northern and southern deserts of Jordan. It is very scarce. It was collected from March to May (KATBEH-BADER et al. 1998 [2003]). AMR et al. (1997) mentioned that it was a rare species in Al Azraq Reserve.

***Madais fausta fausta***

OLIVIER 1804 (Fig. 1g)

The Salmon Caper Butterfly is a rather migratory species with a distribution confined to the Jordan Valley and the upper Mediterranean zone. Other earlier localities include Zarqa Main and Petra (LARSEN & NAKAMURA 1983). It seems that it has two broods, one in spring and another towards the end of July. LARSEN (1975) suggested that a regular migratory contact with the Arabian populations occurs to ensure the survival of the Jordanian populations.

***Colotis phisadia phisadia GODART 1819***

The Blue Spotted Arab is common in tropical Africa, Arabia and Jordan. It is limited to the Dead Sea area in Jordan (KATBEH-BADER et al. 1998 [2003]). But it is possible to have contacts with the Arabian populations through Wadi Arabah and Aqaba. The food plant is *Salvadora persica*.

***Colotis chrysonome KLUG 1829***

The Golden Arab is an afrotropical species with limited distribution in Jordan. LARSEN & NAKAMURA (1983) stated that tropical oasis in southern part of the Dead Sea are typical localities for this butterfly. It is associated with *Maerua crassifolia* as a food source. Population fluctuation of the Golden Arab is dependent on the survival of the food source (WALKER & BITTAWAY 1987).

***Colotis danae eupompe***

KLUG 1829 (Fig. 1h)

The Scarlet Tip is an afrotropical butterfly being one of the most widespread butterflies in dry tropical Africa, but also occurs in India. Only one specimen is known from Egypt. It is Common in southwestern Arabia and Dhofar. This species is recorded from Jordan for the first time and apparently very rare. The single specimen was collected from Mahis on the 7<sup>th</sup> of June 1991 (KATBEH-BADER et al. 1998 [2003]). Larvae feed on *Cadaba* spp. and perhaps other Capparidaceae (LARSEN 1990).

***Anaphaeis aurota aurota* FABRICIUS 1793**

The Caper white is a strong tropical migrant butterfly. LARSEN & NAKAMURA (1983) referred to several occasions citing the migratory behaviour of this butterfly in Lebanon and Palestine. It prefers the warm Jordan Valley, however, it was collected from two localities within the eastern mountains. It feeds on *Capparis spinosa*.

***Euchloe ausonia melisande***

FRUHSTORFER 1908 (Fig. 2a)

The *E. ausonia* complex is found all around the Mediterranean and in Asia Minor. The Dappled White is common in both Mediterranean zones of Jordan. It feeds on *Brassica* and *Sinapis* (Cruciferae).

***Euchloe belemia belemia* ESPER 1799**

The Green-striped White extends from the Iberian Peninsula, via North Africa to the Middle East and Iran to Bluchistan. In addition, it was recorded from Ethiopia and Arabia. It is a common species in the northern Mediterranean zone of Jordan and known to occur in the Jordan Valley. Apparently, it has one brood in the spring, with highest peak of emergence in April (KATBEH-BADER et al. 1998 [2003]).

***Euchloe aegyptiaca* VERITY 1911**

The Woad White is confined to southern Jordan. This species is widely distributed over North Africa, northern Arabia and southern Jordan and Palestine (LARSEN 1990).

***Euchloe falloui* ALLARD 1867**

The Scarce Green Striped White was recorded from southern Jordan (LARSEN & NAKAMURA 1983), and is considered linked

to the Saharo-Sindian habitats in North Africa.

***Elphinstonia charlonia charlonia***

DONZEL 1842

The Greenish Black-tip is an eremic butterfly, distributed from North Africa via the Middle East to Afghanistan. In Jordan, it is mostly associated with the Irano-Turanian zone, with fewer populations occurring in the Jordan Valley. AMR et al. (1997) reported on its rare occurrence in Al Azraq Reserve. Previous collecting dates suggest up to three broods per year. It feeds on several species of *Diplotaxis*, and Rough and Sweet Stock (*Matthiola* sp.).

***Zegris eupheme uarda* HEMMING 1929**

The Sooty Orange Tip occurs in dry parts of Jordan such as the Dead Sea area and the desert between Jordan and Iraq. In Jordan, the subspecies *Z. e. uarda* is limited to the Irano-Turanian zone separating the Mediterranean vegetation from the lower parts of Jordan Valley. One brood appears from late February to early April (KATBEH-BADER et al. 1998 [2003]).

***Zegris eupheme tigris* RILEY 1921**

This butterfly is known to occur in Iraq, Syrian Desert and Hejaz. This subspecies differs from *Z. e. uarda* in the markings of the underwing, where as the yellow suffusion covers about 90 % of the wing surface while 60 % in case of *Z. e. uarda* (LARSEN & NAKAMURA 1983). It was collected from southern Jordan and near Zarka (LARSEN & NAKAMURA 1983).

***Zegris euphema larseni* PITTAWAY 1985**

BENYAMINI (2001) listed this subspecies from southern Jordan.

***Anthocharis gruneri gruneri***

HERRICH-SCHÄFFER 1851 (Fig. 2b)

The Gruner's Orange Tip is found in south Europe and Turkey and in Palestine (LARSEN & NAKAMURA 1983). KATBEH-BADER et al. (1998 [2003]) recorded this species from Wadi As Salt and the northern Mediterranean zone.

***Anthocharis cardamines phoenissa***

VON KALCHBERG 1894

The Orange Tip is found from Western Europe, temperate Asia to Japan. LARSEN &



a



b



c



d



e



f



g



h

NAKAMURA (1983) included this species based on TREVOR TROUGHT's field notes. Specimens collected by KATBEH-BADER et al. (1998 [2003]) confirm the presence of this species in Jordan. The localities are within the most northwestern part of the northern Mediterranean zone. This species is quite common in Lebanon and Palestine.

### **Coliadinae**

#### ***Colias croceus croceus* GEOFFROY 1785**

The Clouded Yellow is common throughout the Mediterranean and the Irano-Turanian zones in Jordan. Collecting dates suggest that it have several broods that fly all-year round. It feeds on several species of *Vicia* (KATBEH-BADER et al. 1998 [2003]). AMR et al. (1997) found it common near cultivated alfalfa in Al Azraq Reserve.

#### ***Catopsilia florella* FABRICIUS 1775**

The African Migrant is a strong migrant species. So far, a single specimen was collected from Aqaba. However, LARSEN & NAKAMURA (1983) stated that it could be found anywhere in Jordan.

#### ***Gonepteryx cleopatra taurica***

STAUDINGER 1881 (Fig. 2c)

The Cleopatra is a typical holomediterranean species. Although LARSEN & NAKAMURA (1983) gave several localities within the northern Mediterranean zone, we have one single locality in northern Jordan (KATBEH-BADER et al. 1998 [2003]). This is a forest-adapted species. Decline in its numbers and distribution may reflect the degradation of forests in Jordan.

### **Family Nymphalidae**

Family Nymphalidae is represented by four subfamilies (Danainae, Charaxinae, Nymphalinae and Satyrinae) and 25 species. The size is intermediate. Red and brown colours predominates the wing pattern. The forelegs are reduced forming

"brushes" and are not used for walking (KORSHUNOV & GORBUNOV 1995).

### **Danainae**

#### ***Danaus chrysippus chrysippus***

LINNAEUS 1758 (Fig. 2d)

The Plain Tiger is a migrant butterfly widely distributed in the Old World tropics. It is common in the Jordan Valley, however, few specimens were caught from Azraq in the Eastern Desert and the Mediterranean region as well. It was seen migrating northward by the Jordan River in 1996 at Al baqurah in the extreme north west of Jordan (KATBEH-BADER et al. 1998 [2003]). The main food plant is *Calotropis procera*, but other Asclepiadaceae are acceptable.

#### ***Hypolimnas misippus* LINNAEUS 1764**

The Diadem is known along the coasts of Arabia (WALKER & PITTAWAY 1987). BENYAMINI (2001) included this species as a migrant species. Females are confused with *D. chrysippus*.

### **Charaxinae**

#### ***Charaxes jasius jasius* LINNAEUS 1767**

The Two-Tailed Pasha is the only palaearctic off-shoot of the tropical genus being local and uncommon species in the Middle East. It is very rare species. The food plant is *Arbutus unedo*.

### **Nymphalinae**

#### ***Junonia orithya here* LANG 1884 (Fig. 2e)**

The Blue Pansy is a tropical migrant but the subspecies *J. o. here* is found in Arabia (LARSEN 1990). BENYAMINI (1997) indicated its occurrence on the western side of the Jordan Valley north of the Dead Sea.

#### ***Junonia hirta cebrene* TRIMEN 1870**

This is a palaeotropical species that extends into Arabia. BENYAMINI (1984) stated that is a quite common species in Sant Katerina in Siani.

**Fig. 2: a:** *Euchloe ausonia melisande*: The Dappled White is common in the Mediterranean zone of Jordan. **b:** *Anthocharis gruneri gruneri*: The Gruner's Orange Tip was collected from Wadi As Salt and from the northern Mediterranean zone.

**c:** *Gonepteryx cleopatra taurica*: The Cleopatra is a typical holomediterranean species. This is a forest-adapted species.

**d:** *Danaus chrysippus*: The Plain Tiger is a migrant butterfly widely distributed all over Jordan. **e:** *Junonia orithya here*: The Blue Pansy is a tropical migrant butterfly with rare occurrence in Jordan. **f:** *Limenitis reducta schiffermuelleri*: The Southern White Admiral is a rare species in Jordan confined to the northern Mediterranean zone. **g:** *Vanessa cardui*: The Painted Lady is a migrant butterfly distributed worldwide. It is one of the most common species that occurs in all parts of Jordan all months of the year. **h:** *Polygonia egea*: The Southern Comma occurs in the northern Mediterranean zone.



a



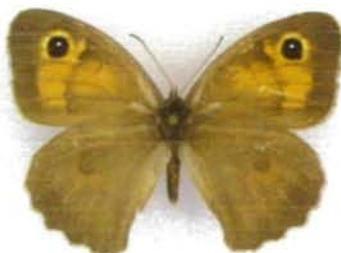
b



c



d



e



f



g



h

***Limenitis reducta schiffermuelleri*****HIGGINS 1933 (Fig. 2f)**

The Southern White Admiral is a rare species in Jordan. All localities are in the northern Mediterranean zone to which the species appears to be limited (KATBEH-BADER et al. 1998 [2003]). It feeds on *Lonicera* sp.

***Vanessa atalanta LINNAEUS 1758***

The Red Admiral is migrant species that occurs in the holarctic region. It is a scarce species in Jordan, mostly recorded from the northern Mediterranean zone but may be found in the Jordan Valley (KATBEH-BADER et al. 1998 [2003]). The food plant is *Parietaria* and *Urtica pilulifera*.

***Vanessa cardui cardui*****LINNAEUS 1758 (Fig. 2g)**

The Painted Lady is a migrant butterfly distributed world-wide. It occurs in all parts of Jordan all months of the year. LARSEN (1976) discussed its migration in the Middle East and emphasised the need for a more comprehensive data on its behaviour. We observed large numbers migrating in north or north-western direction in February 1997 in Wadi Arabah and in the Jordan Valley. However, later in the season they were seen migrating in south or south-eastern direction (KATBEH-BADER et al. 1998 [2003]). AMR et al. (1997) found this species to be common in Al Azraq Reserve. The normal food plants are species of *Carduus*, *Cynara*, *Arctium* and other Composites.

***Polygonia egea egea*****CRAMER 1775 (Fig. 2h)**

The Southern Comma occurs in the northern Mediterranean zone but may be found also in the Jordan Valley (at Gawr Kabid). It has two or three broods from March to November (KATBEH-BADER et al. 1998 [2003]). The food plants are species of *Parietaria*.

***Melitaea phoebe telona FRUHSTORFER 1908***

The Knapweed Fritillary occurs from North Africa and Spain to Korea. This species is common in the Mediterranean zones. The first brood flies in April, a second brood may occur late in the year but apparently in low numbers. LARSEN (1974) found it on *Centaurea calcitrapa*, *Carduus pycnocephalus* in Lebanon.

***Melitaea arduinna evanescens*****STAUDINGER 1886**

The Freyer's Fritillary is distributed from Bulgaria and Asia Minor to Iran and Central Asia. It was assumed that the subspecies *M. a. evanescens* is limited to As Salt area (LARSEN & NAKAMURA 1983), however, KATBEH-BADER et al. (1998 [2003]) collected specimens from other areas like Jarash and Amman. Even though it was considered as a rare species, its numbers appear to be more than previously thought. A large number was observed flying in March at a sunny day in near Amman (KATBEH-BADER et al. 1998 [2003]). The Jordanian populations are perhaps relicts of a brief period in time when there was a wet Irano-Turanian bridge between Jordan and Iraq (LARSEN & NAKAMURA 1983).

***Melitaea perseae sargon HEMMING 1932***

Only a single specimen was collected from Wadi Rajil by LOCKHART (LARSEN & NAKAMURA 1983). This species represents a relict in Jordan, however, it was collected from Saudi Arabia (LARSEN & NAKAMURA 1983).

***Melitaea trivia syriaca*****REBEL 1905 (Fig. 3a)**

The Mullein Fritillary is common in the Mediterranean zones, Jordan Valley and fringes on eastern desert. Peak activity extends from April to June (KATBEH-BADER et al. 1998 [2003]). The Larvae feed on *Verbascum* sp.

**Plate 3: a:** *Melitaea trivia syriaca*: The Mullein Fritillary is a common butterfly in the Mediterranean zones, Jordan Valley and fringes on eastern desert. **b:** *Melanargia titea titania* L.: The Palestine Marbled White occurs in the Mediterranean zone. **c:** *Ypthima asterope*: The African Ringlet is distributed in the Mediterranean zones and the Jordan valley. **d:** *Pseudochazara telephassa*: The Telephassa Grayling is the most common satyrid in Jordan occurring in both Mediterranean zones and eastern desert. **e:** *Maniola telmessia*: The Eastern Meadow Brown is restricted to the northern Mediterranean zone. **f:** *Hyponephele lupinus centralis*: The Oriental Meadow brown appears to be limited to the northern Mediterranean zone. **g:** *Epamara glaucus*: The Arabian Sapphire is distributed in arid regions of the southern end of Dead Sea. It is associated with the striking flowers of *Loranthus* sp. **h:** *Lycaena phlaeas timeus*: The Small Skipper is found in temperate Palaearctic regions. Collected from the Jordan Valley as well as from densely forested areas.

*Melitaea deserticola macromaculata*

BELTER 1934

The Desert Fritillary occurs in the Mediterranean zones, the fringes of the Jordan Valley and southern desert. Its flight is much higher above the ground than that of other Jordanian *Melitaea*. Larvae feed on species of Scrophulariaceae. Three broods are probable, the second and the third are partial and irregular (LARSEN & NAKAMURA 1983).

*Melitaea collina collina* LEDERER 1861

The Laderer's Fritillary is a Syrian species with distribution extending to south Turkey, Lebanon, and Parts of Iraq (LARSEN 1974). BENYAMINI (2001) listed this species as doubtful or unconfirmed observation in his list on the butterflies of Jordan and Dana Reserve.

**Satyrinae***Melanargia titea titania*

CALBERLA 1891 (Fig. 3b)

The Palestine Marbled White occurs in the Levant. LARSEN & NAKAMURA (1983) mentioned that it is limited in Jordan to the northern Mediterranean zone, but the record from At Tafila proves its occurrence in the southern Mediterranean zone (KATBEH-BADER et al. 1998 [2003]). Its peak activity appears to be in May as the above data suggest. A second brood is possible towards the end of the year. Larvae feed on grasses and adults are attracted to the flowers of *Carduus* and *Centaurea*.

*Hipparchia fatua sichaea* LEDERER 1857

The Freyer's Grayling is a Pontomediterranean species, distributed from the Balkans via the Middle East and Iran to Turkmenistan. A single brood occurs in June and July, while specimens collected later in the year are aestivating females who appear to oviposit at the onset of autumn. The food plants are grasses (LARSEN & NAKAMURA 1983).

*Hipparchia pisidice* KLUG 1832

The Sinai Grayling occurs in Sinai, the Levant and southern parts of Turkey. It was previously recorded from several localities in the northern Mediterranean zone only. It is possible that the species occurs in the

southern Mediterranean zone as well (KATBEH-BADER et al. 1998 [2003]).

*Chazara persephone transiens*

ZERNY 1932

This species has been recorded once during 1927 from localities on the fringe of the Eastern Desert (LARSEN & NAKAMURA 1983).

*Pseudochazara telephassa*

GEYER 1827 (Fig. 3d)

The Telephassa Grayling is the most common satyrid in Jordan occurring in both Mediterranean zones and eastern desert. Even though it was collected from June to August, LARSEN & NAKAMURA (1983) mentioned records from October and they assumed a single protracted brood.

*Maniola telmessia telmessia*

ZELLER 1847 (Fig. 3e)

The Eastern Meadow Brown is restricted to the northern Mediterranean zone (KATBEH-BADER et al. 1998 [2003]). It has one brood in April and May. Specimens collected later in the year are aestivating individual appearing to oviposit (LARSEN & NAKAMURA 1983).

*Hyponephele lupinus centralis*

RILEY 1921 (Fig. 3f)

The Oriental Meadow Brown occurs in North Africa, southern Europe, Asia Minor, the Levant, Iran, Afghanistan. In Jordan, it appears to be limited to the northern Mediterranean zone. It has a single brood in May and June or July (KATBEH-BADER et al. 1998 [2003]). Specimens collected in August or September are assumed to be aestivating individuals appearing to oviposit (LARSEN & NAKAMURA 1983).

*Ypthima asterope* KLUG 1832 (Fig. 3c)

The African Ringlet is distributed in dry parts of tropical Africa, Arabia, and much of tropical Asia. It is common in the Mediterranean zones and the Jordan valley (KATBEH-BADER et al. 1998 [2003]). It appears to have many broods from March to November. Only one specimen is known from Al Azraq Reserve in the eastern desert (AMR et al. 1997).

***Lasiommata maera orientalis*****HEYNE 1894**

The Large Wall Brown occurs in North Africa, most of Europe, the Levant, the Middle East to the Himalayas. It was collected mainly in the northern Mediterranean zone from April to July, which may represent two broods.

***Lasiommata megera emilyssa*****VERITY 1919**

The Wall Brown is a holomediterranean species. It was collected from the northern Mediterranean zone of Jordan, but also from Petra in the southern Mediterranean zone. It flies from February to August and probably to October (LARSEN & NAKAMURA 1983).

**Family Lycaenidae**

This family is represented by three subfamilies (Theclinae, Aphnaeinae and Lycaeninae) and 27 species. Lycaenids are small butterflies. The head is globular; and the forelegs are reduced in males. Wing coloration is very diverse, however, most frequently blue, brown, or orange in colour. Sexual dimorphism is well defined in the majority of species (KORSHUNOV & GORBUNOV 1995).

**Theclinae*****Deudorix livia* KLUG 1834**

The Pomegranate Hairstreak was previously collected from localities extending from Debbin in northern Jordan, as far as Aqaba in the south. It was collected from forested areas as well as from several localities in the Jordan Valley. It is quite common during August and September and declines towards December and then emerges again in early June (KATBEH-BADER et al. 1998 [2003]). LARSEN & NAKAMURA (1983) suggested a migratory status for this species, and indicated that autumn populations can persist.

***Epamera glaucus* BUTLER 1885 (Fig. 3g)**

The Arabian Sapphire is distributed throughout the African horn (Somalia and Ethiopia) and some parts of the Arabian Peninsula (LARSEN 1983). It is associated with the striking flowers of *Loranthus* sp., a parasitic plant on *Acacia* trees.

***Tomares nesimachus* OBERTHÜR 1893**

This species is remarkable in its association with soil type. LARSEN & NAKAMURA (1983) stated that this species is associated with soil where *Astragalus macrocarpus* grows. Recorded earlier from Rabba near Karak.

**Aphnaeinae*****Apharitis acamas acamas* KLUG 1834**

The Leopard Butterfly is an eremic species and several subspecies are recognised across the Sahara to India. Similar to the previous findings of LARSEN & NAKAMURA (1983), it seems that the Leopard Butterfly occurs in northern Jordan from June to October while in the Jordan Valley, it can be found in December (KATBEH-BADER et al. 1998 [2003]).

***Apharitis myrmecophila myrmecophila*****DUMONT 1922**

This is an eremic species with known distribution in the eastern desert (LARSEN & NAKAMURA 1983).

**Lycaeninae*****Lycaena phlaeas timeus*****CRAMER 1777 (Fig. 3h)**

The Small Skipper is found in the temperate palaearctic regions, Greenland and eastern North America. The subspecies *L. ph. timeus* was collected from the Jordan Valley (LARSEN & NAKAMURA 1983) as well as from the densely forested areas (KATBEH-BADER et al. 1998 [2003]). Apparently, it is a resident species and occurs throughout the months of the year, with high abundance in May and June. Larvae feed on the flowers of *Rumex* and *Polygonum*.

***Lycaena thersamon omphale*****KLUG 1834 (Fig. 4d)**

The Lesser Copper occurs from Italy and Austria to the Balkans, the Middle east and Afghanistan. LARSEN & NAKAMURA (1983) discussed the subspecific forms of this species; *L. th. kurdistanica* and *L. th. omphale*, and concluded that the later is a valid subspecies for the Levantine. It was collected from the Mediterranean zones as well as from several localities within the Irano-Turanian zone (KATBEH-BADER et al. 1998 [2003]). Collecting dates suggest two broods, one in April, followed by another in August.

**Polyommatinae*****Anthene amarah amarah***

GUÉRIN-MÉNÉVILLE 1847

The Leaden Ciliate Blue is a typical afrotropical species that occur in arid Africa and Arabia. It was collected from Aqaba. It feeds primarily on *Acacia* that are common along Wadi Araba (LARSEN & NAKAMURA 1983).

***Lampides boeticus* LINNAEUS 1767**

The Long-tailed Blue is widely distributed in the Paleotropics from which it migrates to palaearctic region. It is found virtually in all types of habitats in Jordan. Collecting dates suggests that two broods emerge annually, one in May and June and another in September and October (KATBEH-BADER et al. 1998 [2003]). LARSEN (1974) stated that *L. boeticus* feeds on a wide range of legume species.

***Leptotes pirithous* LINNAEUS 1767**

The Common Zebra Blue is an afrotropical species that succeeded to penetrate the Arabian Peninsula and southern Europe. It is common during early autumn to December in the Jordan Valley and disappears thereafter. It was seen in large numbers in alfalfa fields in Gawr Kabid in the Jordan Valley (KATBEH-BADER et al. 1998 [2003]).

***Tarucus balkanicus* FREYER 1845**

The Little Tiger Blue is widely distributed along the Jordan Valley, with limited distribution in the Mediterranean zone (LARSEN & NAKAMURA 1983).

***Tarucus rosaceus* AUSTAUT 1885**

The Mediterranean Pierrot has a wide range of distribution extending from North Africa to northwestern India. It was collected from wadis with permanent water bodies that host a wide variety of wild flowers all year round (KATBEH-BADER et al. 1998 [2003]). The main food plant is *Zizyphus spina-christi*.

***Zizeeria karsandra* karsandra  
MOORE 1865**

The Asian Grass Blue is found from Australia, via India, to Oman, Iraq, Lebanon, Egypt, Libya and Tunisia. It is common in the Jordan Valley, however, it was found to be local within the Mediter-

ranean zones (LARSEN & NAKAMURA 1983).

It feeds on several Papilionaceae species.

***Azanus jesous***

GUÉRIN-MÉNÉVILLE 1849 (Fig. 4b)

African Babul Blue is a migrant butterfly found in Africa, Arabia, Middle East and India. It is rather common in warm habitats with watercourses. It was collected previously from several localities along the Jordan Valley as well as from Aqaba. But it is not expected to be a permanent resident in Jordan (LARSEN & NAKAMURA 1983). The food plant is *Acacia* spp. but *Prosopis* is a possible host.

***Azanus ubaldus* CRAMER 1782**

The Velvet Spotted Blue is a migrant species that inhabits rocky desert habitats. It was collected near Aqaba (LARSEN & NAKAMURA 1983).

***Pseudophilotes vicrama astabene*  
HEMMING 1932**

The distribution of this butterfly is confined to the northern Mediterranean mountains. It is associated with *Thymus* sp. (LARSEN & NAKAMURA 1983). Several subspecies are known across central and southern Europe via the Middle East eastwards to Afghanistan.

***Pseudophilotes abencerragus nabataeus*  
GRAVES 1925**

The occurrence of this subspecies is restricted to the southern mountains of Jordan (Petra) and the Irano-Turanian zone (LARSEN & NAKAMURA 1983).

***Pseudophilotes jordanicus*  
BENYAMINI 2000**

BENYAMINI (2000) described this species from the southeastern Mediterranean zone. We did not collect any further specimens.

***Iolana alfierii* WILTSHERE 1948**

One single specimen was collected from Petra. According to LARSEN & NAKAMURA (1983), this species is only known from Sinai, the Naqab desert of Palestine and Petra in Jordan.

***Chilades galba* LEDERER 1855**

The Lederer's Cupid is an eremic species with a wide range of distribution. It is a migrant species common in the Jordan Valley and was found locally in the northern

Mediterranean zone and eastern desert (KATBEH-BADER et al. 1998 [2003]). The food plants are *Prosopis* and *Acacia*.

#### *Freyeria trochylus trochylus* FREYER 1845

The Grass Jewel is found in Africa, the Middle East, the Balkans, Arabia, Iran, Afghanistan and north-western India. It was collected from several localities within all the biogeographical regions of Jordan. Several broods are possible from April through October. Food consists of *Heliotropium* and *Indigofera*.

#### *Plebejus pylaon* spp.

HEMMING 1934 (Fig. 4c)

Three subspecies of the Zephyr Blue are known to occur in the Middle East. *Plebejus pylaon nicholli* ELWES in Lebanon and Jordan, *Plebejus pylaon cleopatra* HEMMING in southern Palestine and Jordan, and *Plebejus pylaon philbyi* GRAVES originally described from Petra (GRAVES 1925, HEMMING 1932, LARSEN & NAKAMURA 1983). LARSEN & NAKAMURA (1983) stated that two subspecies occur in Jordan; *P. p. cleopatra*, common in the transitional zone between the Mediterranean and the Irano-Turanian zones, and *P. p. philbyi* occurring in desert and arid habitats. Evidently, number of broods vary according to the biogeographical region; where as one brood appears in the spring in the Mediterranean zone, while two broods are laid in more warm and dry habitats. It feeds on *Astragalus* spp. (Papilionaceae). BENYAMINI (2001) listed *Plebejus pylaon nicholli* as doubtful or unconfirmed observation.

#### *Aricia agestis agestis*

DENIS & SCHIFFERMÜLLER 1775

The Brown Argus is found in Europe, the Levant and Iran. It appears to be a rare species in Jordan. It was collected previously from several localities within the northern Mediterranean zone of Jordan (KATBEH-BADER et al. 1998 [2003]). The collecting dates suggest two broods, one in the spring and the second towards the end of the summer. It feeds on *Erodium* and *Helianthemum*.

#### *Polyommatus icarus zelleri*

VERITY 1919 (Fig. 4a)

The Common Blue is common in North Africa, Europe, the Middle East and most of temperate Asia. It is the most common lycaenid in Jordan, inhabiting a wide range of

habitats. It was collected from the northern and southern Mediterranean zones, Jordan Valley as well as desert habitats (KATBEH-BADER et al. 1998 [2003]). Multiple broods are evident as the collecting dates indicate. These broods vary in number depending on the biogeographical zone. It was found to feed *Lotus* and *Medicago*.

#### *Polyommatus loewii uranicola*

WALKER 1870

LARSEN & NAKAMURA (1983) gave a detailed discussion on the variants and distribution of the Loew's Blue in the Middle East. It was collected from the Mediterranean zone and the eastern desert of Jordan.

### Family Hesperiidae

Skippers are represented by two subfamilies (Pyrginae and Hesperiinae) and 16 species. Butterflies of this family are of small, and few are of intermediate size. The antennal club is rather smooth. The fore wings are triangular in shape. Legs are developed. Larvae are naked and spindle in shape (KORSHUNOV & GORBUNOV 1995).

#### Pyrginae

##### *Pyrgus melotis* DUPONCHEL 1834

The Levantine Grizzled Skipper is found in the Levant and south-eastern Turkey. In Jordan, it is restricted to the northern Mediterranean zone, where it was previously collected from Debbin and Hemmie. It prefers moist habitats such as small permanent springs bordered by *Rubus* (LARSEN & NAKAMURA 1983). Apparently, one brood is deposited in the spring, while in Lebanon, LARSEN (1974) indicated that two generations appear.

##### *Spialia orbifer hilaris* STAUDINGER 1901

The Orbiferous Skipper occurs in the northern Mediterranean zone. LARSEN & NAKAMURA (1983) stated that two broods are produced, one in early April and the second in July.

##### *Spialia doris doris* WALKER 1870

One single specimen was collected from Azraq in 1927 (HEMMING 1932). This subspecies is known to occur in Arabia, Jordan and parts of the Naqab and Sinai (LARSEN



a



b



c



d



e



f

**Plate 4:** **a:** *Polyommatus icarus zelleri*: The Common Blue is the most common lycaenid in Jordan, inhabiting a wide range of habitats. **b:** *Azarus jesous*: The African Babul Blue is a migrant butterfly, it is common in warm habitats with watercourses. **c:** *Plebejus pylaon* spp.: Three subspecies of the Zephyr Blue are known to occur in the Middle East. *Plebejus pylaon nichollii* Elwes in Lebanon and Jordan, *Plebejus pylaon cleopatra* Hemming in southern Palestine and Jordan, and *Plebejus pylaon philbyi* Graves. **d:** *Lycaena thersamon omphale*: The Lesser Copper occurs in the Mediterranean zone as well as from several localities within the Irano-Turanian zone. **e:** *Carcharodus alceae*: The Hollyhock Skipper is a common species in Jordan found almost all year round. **f:** *Thymelicus lineola fornax*: it is a common species, inhabiting both the Jordan Valley and the northern and southern Mediterranean zones.

& NAKAMURA 1983). It seems that this is a rare species; it was not observed over 12 visits in eight years in Egypt (LARSEN & NAKAMURA 1983).

#### ***Syrichtus tessellum nomas* LEDERER 1855**

The Tessellated Skipper can be found from the Balkans via the Middle East to Central Asia. The subspecies *nomas* is rare in Jordan. So far, with this record, only 11 specimens were ever collected from Jordan, however, it is quite common in Palestine and Lebanon (LARSEN & NAKAMURA 1983). Collected previously from Jarash, Ajlun and Wadi Zarka, from various types of habitats including olive grooves. Most probably larvae feed on *Phlomis* spp.

#### ***Syrichtus proto hieromax* HEMMING 1932**

The Large Grizzled Skipper is a Mediterranean butterfly found in North Africa, Iberian Peninsula, Turkey and the Levant. The subspecies *hieromax* was originally described from Ajlune, Jordan (HEMMING, 1932), and seems to be localised in Jordan, Palestine and the coastal region of Lebanon. LARSEN & NAKAMURA (1983) discussed the status of the two subspecies of this form; *Syrichtus proto hieromax* is found in the coastal areas of Lebanon and it is rare in both Jordan and Palestine, and *Syrichtus proto lycaonius* is distributed in the Lebanese mountains. LARSEN & NAKAMURA (1983) expected *Phlomis* spp. as hosts.

#### ***Muschampia proteides stepporum* BENYAMINI & AVINI 2001**

This subspecies was described from the steppe belts of southern Palestine and Dana Nature Reserve in Jordan (BENYAMINI & AVINI 2001).

#### ***Carcharodus alceae alceae* ESPER 1780 (Fig. 4e)**

The Hollyhock Skipper is a common species in Jordan found almost all year round. Localities reported are within the northern Mediterranean zone and the Jordan Valley (KATBEH-BADER et al. 1998 [2003]). Also, collecting dates suggests that two broods are produced annually, one in early spring followed by one by the end of summer. The food plants are *Malva* and *Althaea*.

#### ***Carcharodus stauderi ambigua***

##### **VERITY 1925**

The North African Skipper is found in a series of subspecies from Morocco to the Levant, Asia Minor and western Iran. It was collected from several localities within the northern Mediterranean zone of Jordan, fringes of the eastern desert and the Jordan Valley. Specimens were collected during April and May, similar to findings indicated by (LARSEN & NAKAMURA, 1983).

#### ***Carcharodus orientalis maccabaeus***

##### **HEMMING 1932**

Known to occur in the Balkans, Asia Minor and the Levant. It was collected from several localities within the Mediterranean zone (LARSEN & NAKAMURA 1983).

#### **Hesperiinae**

##### ***Thymelicus acteon phoenix* GRAVES 1925**

This skipper is confined to the northern Mediterranean zone (LARSEN & NAKAMURA 1983). It has a single brood and adults were collected during April and May (LARSEN & NAKAMURA 1983).

##### ***Thymelicus sylvestris syriaca* TUTT 1905**

BENYAMINI (2001) listed this species as an inhabitant of the northern Mediterranean zone, and as a secondary in the southern Mediterranean. This species is known from northern Palestine and the Golan (BENYAMINI 1997).

##### ***Thymelicus lineola fornax***

##### **HEMMING 1934 (Fig. 4f)**

This species has a wide range of distribution throughout North Africa, Most of Europe to Asia Minor and the Levant. LARSEN & NAKAMURA (1983) differentiated between the Lebanese subspecies (*Th. l. melissus*) and the Jordanian form on the basis of larger size and the more pointed wings of *fornax*. In Jordan, it is a common species, inhabiting both the Jordan Valley and the northern and southern Mediterranean zones (KATBEH-BADER et al. 1998 [2003]). Peak collecting was in May. Specimens were reported further south as far as Petra. The food plants are grasses, especially the genera *Tridium* and *Arrhenatherum*.

***Gegenes nostrodamus* FABRICIUS 1793**

This butterfly was collected from the upper Jordan Valley, the northern Mediterranean zone and close to the eastern desert (LARSEN & NAKAMURA 1983).

***Gegenes gambica* MABILLE 1878**

The Pigmy Skipper is a Mediterranean butterfly. It was collected from several localities ranging from the Jordan Valley to the east in Zarka (LARSEN & NAKAMURA 1983). Collecting dates suggest that the Pigmy Skipper have two broods, one in the spring and the other towards the end of the summer, with peak activity in September (KATBEH-BADER et al. 1998 [2003]).

***Gomalia elma elma* TRIMEN 1862**

This is a palaeotropical species distributed over Africa and Arabia. It was recorded by BENYAMINI (2001) as a migrant in the Dead Sea area and Aqaba.

***Pelopidas thrax thrax* HÜBNER 1821**

The Millet Skipper occurs in Arabia, Egypt and the Middle East. It was previously collected from the Jordan Valley as well as from northern Mediterranean zone mostly in September and November. It appears that the Millet Skipper is not common in Jordan. LARSEN (1974) reported on the migratory behaviour of this species in Lebanon, and perhaps its scarce population in Jordan represents migrants.

**Discussion**

The butterflies fauna of Jordan is diverse, totalling 97 species that belongs to five families (Lycaenidae, Nymphalidae, Pieridae, Hesperiidae and Papilionidae).

Based on BENYAMINI (2001), the butterflies fauna of Jordan consists of 61.7, 9.6, 10.6, 2.1 and 16 % of palearctic, afrotropical, palaeotropical, oriental and eremic species respectively. BENYAMINI (1988) considered *Madais fausta*, *Zizeeria karsandra* and *Limentis reducata* as oriental elements, while BENYAMINI (2001) listed 15 species as eremic.

Most species occur in the northern Mediterranean zone (67), while the least number occurs in the eastern Desert (BENYAMINI (2001). At least 20 species

(about one fifth of the total butterflies species) are migrants (LARSEN & NAKAMURA 1983). Some of these migrants include; *Danaus chrysippus*, *Catopsilia florella*, *Euchloe ausonia*, *Madais fausta*, and *Junonia orithya*.

KATBEH-BADER et al. (1998 [2003]) examined 3350 specimens of butterflies, and reported 65 species, which is far more less than the records given by LARSEN & NAKAMURA (1983). Also, BENYAMINI (2001, 2002a, b) reported 58 species from Dana Nature Reserve. Perhaps the decline of some populations is due to changes in the natural environment of Jordan that went through extensive changes in the form of irrigated agriculture and urbanisation, loss of natural habitats, expanding agriculture, and uncontrolled use of pesticides. However, the absence of the unrecorded species does not necessarily indicate their extension. These species are perhaps migrants, very rare or extremely local in distribution. For example, *Catopsilia florella*, a migrant species found in tropical Africa, was recorded only twice within the past 50 years. *Chazara persephone*, a Levantine species, was recorded once from Jordan in 1927. *Tomares nesimachus*, another Levantine species, is associated with a special type of soil on which the food plant, *Astragalus macrocarpus*, grows (LARSEN & NAKAMURA 1983).

Further studies should investigate the status and ecology of the butterflies of Jordan to better understand their conservation.

**Zusammenfassung**

Die Schmetterlinge Jordaniens: 97 Arten und Unterarten von Schmetterlingen wurden aus verschiedenen Ökozonen Jordaniens nachgewiesen. Für jede Art werden biologische und ökologische Bemerkungen angeführt und eine aktualisierte Liste der Schmetterlinge Jordaniens ist beigelegt.

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